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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/588,935
Filing Date: August 09, 2006
Appellant(s): IWASAKI, OSAMU

Suzanne C. Walts (reg. No. 60,831)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/3/2008 appealing from the Office action mailed 4/1/2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

JP 08-062426	Aihara et al.	03-08-1996
JP 05-249320	Furukawa et al.	09-28-1993
JP 11-149073	Kunishige	06-02-1999
US 2003/0210210	Ide et al.	11-13-2003
US 5402324	Yokoyama et al.	03-28-1995

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

i. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

ii. **Claims 1-3, 5-18, 21, 23, 25 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Aihara et al. (JP 08-062426), and further in view of Furukawa et al. (JP 05-249320).

(a) With respect to **claims 1 and 2**, Aihara et al. teach a transparent light guide plate having a rectangular light exit surface (light guide plate 11 has a rectangular light exit surface; Drawing 1). Aihara et al. teach a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing side of said thick portion (clearly shown in Drawing 1). Aihara et al. also teach the thin edge portions being formed in parallel on both sides of said thick portion (looking at the two sides of Drawing 1, one can see both the parallel sides have thin edge portions). Aihara et al. also teach a parallel groove (slot 14) which accommodates a bar-like light source (fluorescent tube 12) and is formed at substantially a center of said thick portion in parallel with two opposing sides (Drawing 1).

Aihara et al teach inclined rear portions (shown in Drawings 1 and 2) which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface, and whose thickness is reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of parallel groove (Drawings 1 and 2). Aihara et al. teach an end portion of said parallel groove being narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface (shown in Drawings 1 and 2). Aihara et al. teach the light guide plate being formed of a single material, thereby having a uniform index of refraction (Drawing 1).

Aihara et al. do not explicitly teach a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of

said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions.

However, Furukawa et al. teach an end portion of said parallel groove being narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface, in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions (the end portions of the dead air space for light sources 8 is narrowed toward the optical diffusion layer 3 the V-shaped groove accounts for the claimed ratio, i.e. rise over slope; Drawing 5).

Furukawa et al teach the inclined rear portions thickness being reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on

both sides of said parallel groove, wherein an end portion of said parallel groove is narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface (Drawing 5), in such a manner that a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove is three or less times as large as an average value of said illuminance or luminance of said emitted light at a second portion corresponding to said inclined rear portions (the end portions of the dead air space for light sources 8 is narrowed toward the optical diffusion layer 3; Drawing 5).

Therefore, it would have been obvious to have the end portion of said parallel groove is symmetrically narrowed such that a peak value of relative illuminance or relative luminance at said first portion of said rectangular light exit surface is three or less times as large as an average value of said relative illuminance or relative luminance at said second

portions of said rectangular light exit surface because this would allow one to equalize the luminance of the backlight unit as needed. Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only ordinary skill in the art. *In re Aller*, 105 USPQ 233. One would have been motivated to do so in order to manipulate the size and brightness of the light guide plate.

(b) With respect to **claim 3**, Aihara et al. teach a transparent light guide plate having a rectangular light exit surface (light guide plate 11 has a rectangular light exit surface; Drawing 1). Aihara et al. teach a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing side of said thick portion (clearly shown in Drawing 1). Aihara et al. also teach the thin edge portions being formed in parallel on both sides of said thick portion (looking at the two sides of Drawing 1, one can see both the parallel sides have thin edge portions). Aihara et al. also teach a parallel groove (slot 14) which accommodates a bar-like light source (fluorescent tube 12) and is formed at substantially a center of said thick

portion in parallel with two opposing sides (Drawing 1). Aihara et al teach inclined rear portions (shown in Drawings 1 and 2) which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface, and whose thickness is reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of parallel groove (Drawings 1 and 2). Aihara et al. teach an end portion of said parallel groove being narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface (shown in Drawings 1 and 2).

Aihara et al. do not explicitly teach a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of

said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions.

However, Furukawa et al. teach an end portion of said parallel groove being narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface, in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions (the end portions of the dead air space for light sources 8 is narrowed toward the optical diffusion layer 3 the V-shaped groove accounts for the claimed ratio, i.e. rise over slope; Drawing 5).

Therefore, it would have been obvious to have the end portion of said parallel groove is symmetrically narrowed such that a peak value of relative illuminance or relative luminance at said first portion of said rectangular light exit

surface is three or less times as large as an average value of said relative illuminance or relative luminance at said second portions of said rectangular light exit surface because this would allow one to equalize the luminance of the backlight unit as needed. Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only ordinary skill in the art. *In re Aller*, 105 USPQ 233. One would have been motivated to do so in order to manipulate the size and brightness of the light guide plate.

(c) With respect to **claim 5**, Aihara et al. teach the light guide plate being formed of a single material, thereby having a uniform index of refraction (Drawing 1). Aihara et al teach the end portion forming an angle of 90 degrees or less, with the angle being obtained by combining two angles between both sides of said sectional shape of said parallel groove and a perpendicular line extending from a center of said bar-like light source toward said rectangular light exit surface (Drawings 1 and 2).

(d) With respect to **claim 6**, Aihara et al. teach the end portion forms an angle of 60 degrees or less, said angle being obtained by combining two angles between both sides of said sectional shape of said parallel groove and a perpendicular line extending from a center of said bar-like light source toward said rectangular light exit surface (Drawings 1 and 2).

(e) With respect to **claim 21**, Aihara et al. teach a transparent light guide plate having a rectangular light exit surface (light guide plate 11 has a rectangular light exit surface; Drawing 1). Aihara et al. teach a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing side of said thick portion (clearly shown in Drawing 1). Aihara et al. also teach the thin edge portions being formed in parallel on both sides of said thick portion (looking at the two sides of Drawing 1, one can see both the parallel sides have thin edge portions). Aihara et al. also teach a parallel groove (slot 14) which accommodates a bar-like light source (fluorescent tube 12) and is formed at substantially a center of said thick portion in parallel with two opposing sides (Drawing 1).

Aihara et al teach inclined rear portions (shown in Drawings 1 and 2) which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface, and whose thickness is reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of parallel groove (Drawings 1 and 2). Aihara et al. teach an end portion of said parallel groove being narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface (shown in Drawings 1 and 2). Aihara et al. teach the light guide plate being formed of a single material, thereby having a uniform index of refraction (Drawing 1).

Aihara et al. do not explicitly teach a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of

said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions.

However, Furukawa et al. teach an end portion of said parallel groove being narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface, in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions (the end portions of the dead air space for light sources 8 is narrowed toward the optical diffusion layer 3 the V-shaped groove accounts for the claimed ratio, i.e. rise over slope; Drawing 5). Furukawa et al. also teach a bar-like light source (light source 2) accommodated in the parallel groove of the light guide plate, a reflector (light reflex object 2a) provided behind said bar-like light source to cover said parallel

groove, a reflective sheet provided on said inclined rear surfaces of said inclined rear portions on both sides of said thick portion of said light guide plate (low refractive-index layer or high reflection factor layer 4), and a diffusion sheet arranged on said rectangular light exit surface of said light guide plate (optical diffusion layer 3).

Therefore, it would have been obvious to have the end portion of said parallel groove is symmetrically narrowed such that a peak value of relative illuminance or relative luminance at said first portion of said rectangular light exit surface is three or less times as large as an average value of said relative illuminance or relative luminance at said second portions of said rectangular light exit surface because this would allow one to equalize the luminance of the backlight unit as needed. Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only ordinary skill in the art. *In re Aller*, 105 USPQ 233. One would have been motivated to do so in order to manipulate the size and brightness of the light guide plate.

(f) With respect to **claim 23**, Furukawa et al. teach a ratio of a peak value of relative illuminance or luminance at a first portion of the rectangular light exit surface of the light guide plate to an average value of relative illuminance or luminance at a second portion of the rectangular light exit surface being determined in accordance with a permissible gap between the rectangular light exit surface of the light guide plate and the diffusion sheet, or a permissible thickness of the planar lighting device (operationally required by the device).

(g) respect to **claims 25 and 26**, Aihara et al. teach a transparent light guide plate having a rectangular light exit surface (light guide plate 11 has a rectangular light exit surface; Drawing 1). Aihara et al. teach a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing side of said thick portion (clearly shown in Drawing 1). Aihara et al. also teach the thin edge portions being formed in parallel on both sides of said thick portion (looking at the two sides of Drawing 1, one can see both the parallel sides have thin edge portions). Aihara et al. also teach a parallel groove (slot

14) which accommodates a bar-like light source (fluorescent tube 12) and is formed at substantially a center of said thick portion in parallel with two opposing sides (Drawing 1). Aihara et al teach inclined rear portions (shown in Drawings 1 and 2) which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface, and whose thickness is reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of parallel groove (Drawings 1 and 2). Aihara et al. teach an end portion of said parallel groove being narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface (shown in Drawings 1 and 2).

Aihara et al. do not explicitly teach a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface

corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions.

However, Furukawa et al. teach an end portion of said parallel groove being narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface, in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions (the end portions of the dead air space for light sources 8 is narrowed toward the optical diffusion layer 3 the V-shaped groove accounts for the claimed ratio, i.e. rise over slope; Drawing 5). Furukawa et al teach the inclined rear portions thickness being reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two

sides to thereby form inclined rear surfaces on both sides of said parallel groove, wherein an end portion of said parallel groove is narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface (Drawing 5), in such a manner that a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove is three or less times as large as an average value of said illuminance or luminance of said emitted light at a second portion corresponding to said inclined rear portions (the end portions of the dead air space for light sources 8 is narrowed toward the optical diffusion layer 3; Drawing 5).

Therefore at the time of the invention, it would have been obvious to one skilled in the art to modify the slot of Aihara et al. to be V-shaped as taught by Furukawa et al. because this increases the luminance of the device. It would have been obvious to have the end portion of said parallel groove is symmetrically narrowed such that a peak value of

relative illuminance or relative luminance at said first portion of said rectangular light exit surface is three or less times as large as an average value of said relative illuminance or relative luminance at said second portions of said rectangular light exit surface because this would allow one to equalize the luminance of the backlight unit as needed. Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only ordinary skill in the art. *In re Aller*, 105 USPQ 233. One would have been motivated to do so in order to manipulate the size and brightness of the light guide plate.

(h) With respect to **claim 7**, Aihara et al. teach the sectional shape of the end portion of the parallel groove being defined by part of two straight lines symmetrical with respect to the center line of the parallel groove which intersect at a peak (the upper part of the slot is the peak where the two straight lines intersect; Drawings 1 and 2).

(i) With respect to **claims 8-10**, Aihara et al. teach all the limitations as disclosed above. Aihara et al. do not explicitly

teach the sectional shape of the end portion of the parallel groove being defined by part of two curved lines symmetrical with respect to the center line of the parallel groove that cross each other at an intersection as a peak. However, Furukawa et al. teach the sectional shape of the end portion of the parallel groove being defined by part of two straight or curved lines symmetrical with respect to said center line of said parallel groove, which cross each other at an intersection as a peak (Drawings 3 and 5). Furukawa et al. teach two curved lines defining the shape of the end portion of the parallel groove being convex or concave with respect to said center line of said parallel groove (recited in claim 8; Drawing 3 and 4). Furukawa et al. also teach two curved lines defining the sectional shape of the end portion of the parallel groove being convex or concave with respect to said center line of said parallel groove (recited in claim 9; Drawings 3 and 4). Furukawa et al. teach two curved lines defining the sectional shape of the end portion of the parallel groove or the sectional shape of said parallel groove comprising part of circular, elliptical, parabolic, or hyperbolic lines, which are convex or concave with respect to said

center line of said parallel groove (recited in claim 10; Drawing 3 and 4).

Regarding the parallel groove being approximated by a tenth-order mathematical function (recited in claim 9), the appellant is advised that, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964, (Fed. Cir. 1985). In this case, the cited limitations failed to distinguish the claimed structure from the patented lightguide of Furukawa et al. See MPEP § 2113. Therefore, at the time of the invention, it would have also been obvious to modify the slot of Aihara et al. to include the different shapes of Furukawa et al. One would have been motivated to do this because this allows for different size lights to be accommodated in the device.

(j) With respect to **claim 11**, Aihara et al. teach all the limitations as disclosed above. Aihara et al. do not explicitly teach the sectional shape of the at least the end portion of the parallel groove being triangular. However, Furukawa et al. teach the sectional shape of at least said end portion of said parallel groove or the sectional shape of said parallel groove being triangular (shown in Drawings 1, 2 and 5). Therefore, at the time of the invention, it would have also been obvious to modify the slot of Aihara et al. to include the different shapes of Furukawa et al. One would have been motivated to do this because this allows for different size lights to be accommodated in the device.

(k) With respect to **claim 12**, Aihara et al. teach all the limitations as disclosed above. Aihara et al. do not explicitly teach the sectional shape at a top of said end portion of the parallel groove being defined by said two straight or curved lines symmetrical with respect to said center line cross each other and a straight or curved line symmetrical with respect to said center line which is connected to said two straight or curved lines before said two straight or curved lines cross each other. However, Furukawa et al. teach the sectional

shape at a top of said end portion of the parallel groove being defined by said two straight or curved lines symmetrical with respect to said center line cross each other and a straight or curved line symmetrical with respect to said center line which is connected to said two straight or curved lines before said two straight or curved lines cross each other (Drawings 3 and 5). Therefore, at the time of the invention, it would have also been obvious to modify the slot of Aihara et al. to include the different shapes of Furukawa et al. One would have been motivated to do this because this allows for different size lights to be accommodated in the device.

(l) With respect to **claim 13**, Aihara et al. teach the sectional shape at the top of said end portion of said parallel groove having a portion parallel with said rectangular light exit surface where said intersection as the peak is chamfered (Drawing 2).

(m) With respect to **claim 14**, Aihara et al. teach all the limitations as disclosed above. Aihara et al. do not explicitly teach the sectional shape of the at least the end portion of

the parallel groove being triangular. However, Furukawa et al. teach the sectional shape of at least said end portion of said parallel groove or the sectional shape of said parallel groove being triangular (shown in Drawings 1, 2 and 5). Furukawa et al. teach the sectional shape at the top of the end portion of the parallel groove being a circular, elliptical, parabolic, or hyperbolic shape obtained by rounding said intersection as the peak symmetrically with respect to said center line (Drawings 3 and 4). It would have been obvious to one skilled in the art at the time of the invention to modify the dead air space of Furukawa et al. to have a trapezoidal shape symmetrical with respect to said center line, since it has been held by the courts that a change in shape or configuration, without any criticality, is nothing more than one of numerous shapes that one of ordinary skill in the art will find obvious to provide based on the suitability for the intended final application. See *In re Dailey*, 149 USPQ 47 (CCPA 1976). It appears that the disclosed device would perform equally well shaped as disclosed by Furukawa et al. One would have been motivated to do this because this allows for different size lights to be accommodated in the device.

(n) With respect to **claim 15**, Aihara et al. teach all the limitations as disclosed above. Aihara et al. do not explicitly teach the sectional shape at the top of the end portion of the parallel groove being a curved shape symmetrical with respect to the center line and convex or concave with respect to the rectangular light exit surface. However, Furukawa et al. teach the sectional shape at the top of the end portion of the parallel groove being a curved shape symmetrical with respect to the center line and convex or concave with respect to the rectangular light exit surface (Drawings 3 and 4). It would have been obvious to one skilled in the art at the time of the invention to modify the dead air space of Furukawa et al. to have a trapezoidal shape symmetrical with respect to said center line, since it has been held by the courts that a change in shape or configuration, without any criticality, is nothing more than one of numerous shapes that one of ordinary skill in the art will find obvious to provide based on the suitability for the intended final application. See *In re Dailey*, 149 USPQ 47 (CCPA 1976). It appears that the disclosed device would perform equally well shaped as disclosed by Furukawa et al.

One would have been motivated to do this because this allows for different size lights to be accommodated in the device.

(o) With respect to **claim 16**, Aihara et al. teach all the limitations as disclosed above. Aihara et al. do not explicitly teach the sectional shape at the top of the end portion of the parallel groove being a circular, elliptical, parabolic, or hyperbolic shape obtained by rounding said intersection as the peak symmetrically with respect to said center line. However, Furukawa et al. teach the sectional shape at the top of the end portion of the parallel groove being a circular, elliptical, parabolic, or hyperbolic shape obtained by rounding said intersection as the peak symmetrically with respect to said center line (Drawings 3 and 4). It would have been obvious to one skilled in the art at the time of the invention to modify the dead air space of Furukawa et al. to have a trapezoidal shape symmetrical with respect to said center line, since it has been held by the courts that a change in shape or configuration, without any criticality, is nothing more than one of numerous shapes that one of ordinary skill in the art will find obvious to provide based on

the suitability for the intended final application. See *In re Dailey*, 149 USPQ 47 (CCPA 1976). It appears that the disclosed device would perform equally well shaped as disclosed by Furukawa et al. One would have been motivated to do this because this allows for different size lights to be accommodated in the device.

(p) With respect to **claim 17**, Aihara et al. teach all the limitations as disclosed above. Aihara et al. do not explicitly teach the sectional shape at the top of the end portion of the parallel groove being defined by part of an elliptical or hyperbolic line. However, Furukawa et al. teach the sectional shape of the end portion of the parallel groove being defined by part of an elliptical or hyperbolic line (Drawing 3). It would have been obvious to one skilled in the art at the time of the invention to modify the dead air space of Furukawa et al. to have a trapezoidal shape symmetrical with respect to said center line, since it has been held by the courts that a change in shape or configuration, without any criticality, is nothing more than one of numerous shapes that one of ordinary skill in the art will find obvious to provide based on the suitability for the intended final application. See *In re*

Dailey, 149 USPQ 47 (CCPA 1976). It appears that the disclosed device would perform equally well shaped as disclosed by Furukawa et al. One would have been motivated to do this because this allows for different size lights to be accommodated in the device.

(q) With respect to **claim 18**, regarding the groove being sanded, the appellant is advised that, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964, (Fed. Cir. 1985). In this case, the cited limitations failed to distinguish the claimed structure from the patented lightguide of Furukawa et al. See MPEP § 2113.

iii. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Aihara et al. (JP 08-062426) and Furukawa et al. (JP 05-249320) as applied to claim 3 above, and further in view of Kunishige (JP 11-149073).

(r) With respect to **claim 4**, Furukawa et al. teach all the limitations as disclosed above. Furukawa et al. do not explicitly teach having the peak of relative illuminance or relative luminance at said first portion of said rectangular light exit surface is twice or less as large as said average value of said relative illuminance or relative luminance at said second portion of said rectangular light exit surface. However, Kunishige teaches equalizing the outgoing radiation luminance distribution of a light guide plate (Para 29). Therefore, it would have been obvious to have the peak of relative illuminance or relative luminance at said first portion of said rectangular light exit surface is twice or less as large as said average value of said relative illuminance or relative luminance at said second portion of said rectangular light exit surface because this would allow one to equalize the luminance of the backlight unit as needed. Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only ordinary skill in the art. *In re Aller*, 105 USPQ 233.

iv. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Aihara et al. (JP 08-062426) and Furukawa et al. (JP 05-249320) as applied to claim 1 above, and further in view of Ide et al. (US 2003/0210210).

(s) With respect to **claim 19**, Aihara et al. and Furukawa et al. teach all the limitations as disclosed above. However, Aihara et al. and Furukawa et al. do not explicitly disclose a halftone dot pattern being formed in a portion of the rectangular light exit surface corresponding to the top of the end portion of the parallel groove. However, Ide et al. teach a random dot pattern 106 being formed in a portion of a light guide plate 108 shown in Fig. 2 (Para 16; lines 1-15). It would have been obvious to one skilled in the art at the time of the invention to modify the device of Aihara et al. and Furukawa et al. to include the random dot pattern of Ide et al. because it generates a reduction of moiré.

v. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over Aihara et al. (JP 08-062426) and Furukawa et al. (JP 05-249320) as

applied to claim 21 above, and further in view of Yokoyama et al. (US 5,402,324).

(t) With respect to **claim 22**, Aihara et al. and Furukawa et al. teach all the limitations as described above. Aihara et al. and Furukawa et al. do not explicitly teach the planar lighting device further comprising a prism sheet arranged between said rectangular light exit surface of said light guide plate and said diffusion sheet. However Yokoyama et al. teaches a prism sheet 7 being arranged between a rectangular light exit surface (liquid crystal panel 5) of said and a diffusing member 3. It would have been obvious to one skilled in the art at the time of the invention to modify the device of Aihara et al. and Furukawa et al. to include the prism sheet of Yokoyama et al. because satisfactory brightness can be maintained.

vi. **Claims 20 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunishige (JP 11-149073).

(u) With respect to **claim 20**; Kunishige teaches light guide plate formed from two or more light guide plates each comprising a rectangular light exit surface (display panel 1), a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing two sides of said rectangular light exit surface (Drawing 2), and thin edge portions formed in parallel on both sides of said thick portion (light guide plates 4, 5 have thin edge portions; Drawing 2). Kunishige also teaches a parallel groove which accommodates a bar-like light source and is formed at substantially a center of said thick portion in parallel with said opposing two sides (shown in Drawing 2) and inclined rear portions which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface (inclined rear portions are shown in Drawing 2). Kunishige teaches the inclined rear portions thickness being reduced from the thick portion toward the thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of said parallel groove (the thickness of the light guide plates 4, 5 are reduced from the thick portion toward the thin edge

portions; Drawing 2), wherein an end portion of said parallel groove is narrowed toward said rectangular light exit surface symmetrically (i.e. they are narrowed at the same percentage, 0%) with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface (Drawing 2), in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions, and wherein said two or more light guide plates are connected with each other at said thin edge portions thereof. It would have been obvious to one of ordinary skill in the art at the time the invention was made to connect two or more light guide plates with each other at the thin edge portions, since it has been held that forming in one piece a structure which has formerly been formed in two, or more pieces, involves only routine skill in the art. *In re Larson, 144 USPQ 347, 349*

(CCPA 1965).

(v) With respect to **claim 24**, Kunishige teaches a liquid crystal display device comprising a backlight unit (Drawing 6) including a planar lighting device. Kunishige teaches a liquid crystal display panel arranged on a light exit surface side of said backlight unit (display panel 1), and a drive unit (energization member 8) driving said backlight unit and the liquid crystal display panel. Kunishige teaches the planar lighting device comprising a light guide plate (light guide plate 4, 5) with a rectangular light exit surface (Drawing 2), a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing two sides of said rectangular light exit surface (Drawing 2), and thin edge portions formed in parallel on both sides of said thick portion (light guide plates 4, 5 have thin edge portions; Drawing 2). Kunishige teaches a parallel groove which accommodates a bar-like light source and is formed at substantially a center of said thick portion in parallel with said opposing two sides (shown in Drawing 2) and inclined rear portions which are symmetrical with respect to a plane including a central axis of said bar-like light source and

perpendicular to said rectangular light exit surface (Drawing 2). Kunishige teaches the inclined rear portions thickness being reduced from the thick portion toward the thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of said parallel groove (the thickness of the light guide plates 4, 5 are reduced from the thick portion toward the thin edge portions; Drawing 2). Kunishige teaches an end portion of the parallel groove being narrowed toward the rectangular light exit surface symmetrically with respect to a center line of the parallel groove perpendicular to the rectangular light exit surface in a sectional shape of said parallel groove in a direction perpendicular to the rectangular light exit surface (Drawing 2), in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions. Kunishige teaches a bar-like light source (light source 3) accommodated in the parallel groove of the light guide plate,

a reflector provided behind said bar-like light source to cover said parallel groove (reflecting plate 7, Drawing 2); a reflective sheet provided on said inclined rear surfaces of said inclined rear portions on both sides of said thick portion of said light guide plate (reflecting plate 7); and a diffusion sheet arranged on said rectangular light exit surface of said light guide plate (diffusion member 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to connect two or more light guide plates with each other at the thin edge portions, since it has been held that forming in one piece a structure which has formerly been formed in two, or more pieces, involves only routine skill in the art. *In re Larson, 144 USPQ 347, 349 (CCPA 1965)*.

(10) Response to Argument

vii. Regarding the Examiner's rejection of independent claims 1, 3, 21 and 25 under 35 U.S.C. 103(a) as being unpatentable over Aihara et al. (JP 08-062426) and further in view of Furukawa et al. (JP 05-249320), the appellant argues (page 11, 2nd paragraph of the Appeal Brief) improper

hindsight reasoning in combining only the shape of the parallel groove of Furukawa with the light guide plate of Aihara et al. .

A. In response to appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the appellant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case, Aihara et al. teach all the limitations as disclosed above, while Furukawa et al. teaches the shape of the parallel groove for the light source may be any desired shape. One skilled in the art would recognize that having a different shape for the parallel groove for the light source would allow them to use different sizes and shapes for light sources, as well as allow for different sizes of light guide plates. Using a V-shaped groove as taught by Furukawa et al. also allows more light from the light source to be captured into the light guide thereby lowering the amount of light loss and increasing the luminance of the light guide.

viii. Regarding the Examiner's rejection of independent claims 1, 3, 21 and 25 under 35 U.S.C. 103(a) as being unpatentable over Aihara et al. (JP 08-062426) and further in view of Furukawa et al. (JP 05-249320), the appellant further argues (page 12, 1st paragraph through page 14, line 2 of the Appeal Brief) that the sectional shape of the narrowed parallel groove recited in the claims is not recognized in the art to be a result-effective variable. However, it is noted that the appellant does not disclose what value or result is desired from the claimed ratio. Therefore, any narrowing of the parallel groove will render a result for the ratio as claimed.

B. In response to appellant's arguments that the sectional shape of the narrowed parallel groove recited in the claims is not recognized in the art to be a result-effective variable, Furukawa et al. teaches several variables where one skilled in the art can derive a mathematical function or ratio in order to have a ration of peak value of illuminance or luminance of emitted light from the bar-like light source that is accommodated in the parallel groove at a first portion of the rectangular light exit surface corresponding to the parallel groove to an average value of illuminance of the emitted light at second portions corresponding to

the inclined rear portions. The appellant is arguing an inherent property of the structure of Aihara et al. and Furukawa. The appellant is defining the shape of the parallel groove by the function that the parallel groove is to perform. While it is noted that the groove is a ratio of peak value of the illuminance or luminance of emitted light from the bar-like light source to an average value of the illuminance or luminance of the emitted light at the second portions which correspond to the inclined rear portions this does not tell what the intended outcome is (i.e. uniform brightness, increased luminance, 3 or less, etc.). Therefore the structure of Aihara et al. and Furukawa is considered to meet the claimed ratio.

C. In response to appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this case, the appellant is only attacking the Furukawa reference. The rejection of the independent claims is Aihara et al. in view of Furukawa.

ix. Regarding the Examiner's rejection of independent claims 25 and 26 under 35 U.S.C. 103(a) as being unpatentable over Aihara et al. (JP 08-062426) and further in view of Furukawa et al. (JP 05-249320), the appellant argues (page 14, ln 12-13of the Appeal Brief) that the Examiner did not address the claims.

D. Regarding the rejection of claims 25 and 26, the appellant is respectfully advised that where a prior art apparatus is identical or substantially identical in structure, claimed properties or functional characteristics are presumed to be inherent, and a prima facie case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430 (CCPA 1977). See MPEP § 2112.01. The appellant is advised to review page 2 of the previous office action which was mailed 4/1/2008 to see where the method claims were addressed and rejected.

x. Regarding the Examiner's rejection of independent claims 20 and 24 under 35 U.S.C. 103(a) as being unpatentable over Kunishige (JP 11-149073) the appellant argues (page 15, 1st paragraph of the Appeal Brief) that Kunishige fails to teach "an end portion of the parallel groove is narrowed toward the rectangular light exit surface symmetrically with

respect to a center line of the parallel groove in the direction perpendicular to the rectangular light exit surface".

E. Regarding claims 20 and 24, in response to appellant's argument that Kunishige fails to teach "an end portion of the parallel groove is narrowed toward the rectangular light exit surface symmetrically with respect to a center line of the parallel groove in the direction perpendicular to the rectangular light exit surface" two or more light guide plates being connected together with each other at the thin edge portions, the appellant is directed to look at drawing 2. In drawing 2, Kunishige shows the end portions of the parallel groove being narrowed toward the rectangular light exit surface symmetrically (i.e. they are narrowed at the same percentage, 0%) with respect to a center line of the parallel groove in the direction perpendicular to the light exit surface (Drawing 2).

xi. Regarding the Examiner's rejection of claims 2, 4-19, 22 and 23, the appellant present no arguments, except stating that such claims depend directly or indirectly from independent claims 1, 3, 21 and 25 would be allowable when/if the independent claims are allowed.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Danielle Dunn/

/Examiner, Art Unit 2875/

/Sandra L. O'Shea/

Supervisory Patent Examiner, Art Unit 2875

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TQAS TC 2800